

Claims

1. A method for preparing water soluble fertilisers in the form of granules or prills comprising as fertilising elements Nitrogen, Phosphor and Potassium, characterised in that it comprises the following phases:

5 a. solubilisation in water of salts containing the fertilising elements of Nitrogen, Phosphor, and Potassium to form a solution, said solution comprising a fraction of non soluble solids in suspension;

b. separation from the solution obtained during the phase a) of the fraction of non soluble solids in suspension, thus obtaining a solution free of solids in suspension;

10 c. concentrating the solution free of solids in suspension obtained from the phase b) until obtaining a solution; and

d. cooling the solution obtained from the phase c) until obtaining granules or prills.

15 2. The method as claimed in claim 1, characterised in that the salt of the Nitrogen fertilising element solubilised during the phase a) is ammonium nitrate.

3. The method as claimed in claim 1, characterised in that the salt of the Phosphor fertilising element solubilised during the phase a) is mono-ammonium phosphate.

20 4. The method as claimed in claim 1, characterised in that the salt of the Potassium fertilising element solubilised during the phase a) is potassium nitrate.

25 5. The method as claimed in claim 1, characterised in that the solution free of salts in suspension obtained from the phase b) has a water content not exceeding 80% by weight.

6. The method as claimed in claim 1, characterised in that the solution in the

phase c) is concentrated until having a water content not exceeding 5% by weight.

7. The method as claimed in claim 1, characterised in that during the solubilisation phase a) also one or more soluble salts are dissolved, containing nutrients selected from the group consisting of S, Ca, Mg, Fe, Mn, Zn, Cu, B and Mo.

8. The method as claimed in claim 1, characterised in that during the solubilisation phase a) also one or more soluble salts containing fertilising elements selected from the group consisting of Nitrogen, Phosphor and Potassium are dissolved.

9. The method as claimed in claim 1, characterised in that it comprises a solubilisation phase a') separate from the phase a) during which one or more soluble salts containing nutrients selected from the group consisting of S, Ca, Mg, Fe, Mn, Zn, Cu, B and Mo are dissolved and a mixing phase during which, before the concentration phase c), the solutions obtained respectively from the phase b) and from the phase a') are mixed together.

10. The method as claimed in claim 1, characterised in that it comprises a solubilisation phase a') separate from the phase a) during which one or more soluble salts containing fertilising elements selected from the group consisting of Nitrogen, Phosphorus and Potassium are dissolved and a mixing phase during which, before the concentration phase c), the solutions obtained respectively from the phase b) and from the phase a') are mixed together.

11. The method as claimed in claim 1, characterised in that the during the solubilisation phase a) a first portion of one or more soluble salts containing nutrients selected from the group consisting of S, Ca, Mg, Fe, Mn, Zn, Cu, B and Mo is dissolved, while a second portion of said soluble salts is dissolved during the

solubilisation phase a') separate from the phase a), said solutions obtained respectively from the phases b) and a') being mixed together, before the concentration phase c).

5 12. The method as claimed in claim 1, characterised in that during the solubilisation phase a) a first portion of one or more soluble salts containing fertilising elements selected from the group consisting of Nitrogen, Phosphor and Potassium is dissolved, while a second portion of said soluble salts is dissolved during the solubilisation phase a') separate from the phase a), said solutions obtained  
10 respectively from the phases b) and a') being mixed together, before the concentration phase c).

13. The method as claimed in claim 1, characterised in that after the phase b), one or more soluble salts containing the nutrients selected in the group consisting of S, Ca, Mg, Fe, Mn, Zn, Cu, B and Mo are dissolved directly in the solution.  
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14. The method as claimed in claim 1, characterised in that after the phase b), one or more soluble salts containing the fertilising elements selected in the group consisting of Nitrogen, Phosphorus and Potassium are dissolved directly in the solution.  
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15. The method as claimed in claim 1, characterised in that one or more soluble salts containing the nutrients selected from the group consisting of S, Ca, Mg, Fe, Mn, Zn, Cu, B and Mo, are in part dissolved during the solubilisation phase and in part solubilised during the phase obtained after the separation phase b).  
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16. The method as claimed in claim 1, characterised in that one or more soluble salts containing the fertilising elements selected from the group consisting of NPK, are in part dissolved during the solubilisation phase and in part solubilised during the

phase obtained after the separation phase b).

17. The method as claimed in claim 1, characterised in that one or more soluble salts containing nutrients selected from the group consisting of S, Ca, Mg, Fe, Mn, Zn, Cu, B and Mo are divided into three flows whereof respectively the first one is added to the solubilisation phase a), the second one is added to the solubilisation phase a') and the third one is solubilised directly to the solution obtained from phase b).

18. A method as claimed in claim 1, characterised in that one or more soluble salts containing fertilising elements selected from the group consisting of NPK are divided into three flows whereof respectively the first one is added to the solubilisation phase a), the second one is added to the solubilisation phase a') and the third one is solubilised directly to the solution obtained from phase b).

19. A water soluble fertiliser in the form of granules or prills comprising as fertilising elements Nitrogen, Phosphorus and Potassium obtained according to a method comprising the following phases:

- a. solubilisation in water of salts containing the fertilising elements of Nitrogen, Phosphor, and Potassium to form a solution, said solution comprising a fraction of non soluble solids in suspension;
- b. separation from the solution obtained during the phase a) of the fraction of non soluble solids in suspension, thus obtaining a solution free of solids in suspension;
- c. concentrating the solution free of solids in suspension obtained from the phase b) until obtaining a solution; and
- d. cooling the solution obtained from the phase c) until obtaining granules or prills.

20. The fertiliser as claimed in claim 19, characterised in that it has a solubility in water of at least 90% by weight.

21. The fertiliser as claimed in claim 19, characterised in that it has a solubility in water of at least 95% by weight.

22. The fertiliser as claimed in claim 19, characterised in that it has a solubility in water of at least 99% by weight.

23. The fertiliser as claimed in claim 19, characterised in that the granules or prills have a dimension lower than 7 mm.

24. The fertiliser as claimed in claim 19, characterised in that the granules or prills have a dimension lower than 4 mm.

25. The fertiliser as claimed in claim 19, characterised in that it is obtained by a method in which, during the solubilisation phase a), also one or more soluble salts containing nutrients selected from the group consisting of S, Ca, Mg, Fe, Mn, Zn, Cu, B and Mo are dissolved.

26. The fertiliser as claimed in claim 19, characterised in that it is obtained by a method in which, during the solubilisation phase a), also one or more soluble salts containing fertilising elements selected from the group consisting of Nitrogen, Phosphorus and Potassium are dissolved.

27. The fertiliser as claimed in claim 19, characterised in that it is obtained by a method which comprises a solubilisation phase a') separate from the phase a) during which one or more soluble salts containing nutrients selected from the group consisting of S, Ca, Mg, Fe, Mn, Zn, Cu, B and Mo are dissolved and a mixing phase during which, before the concentration phase c), the solutions obtained respectively from the phase b) and from the phase a') are mixed together.

28. The fertiliser as claimed in claim 19, characterised in that it is obtained by a method which comprises a phase a') separate from the phase a) during which one or more soluble salts containing fertilising elements selected from the group consisting of Nitrogen, Phosphorus and Potassium are dissolved and a mixing phase during which, before the concentration phase c), the solutions obtained respectively from the phase b) and from the phase a') are mixed together.

29. The fertiliser as claimed in claim 19, characterised in that it is obtained by a method in which, during the solubilisation phase a) a first portion of one or more soluble salts containing nutrients selected from the group consisting of S, Ca, Mg, Fe, Mn, Zn, Cu, B and Mo is dissolved, while a second portion of said soluble salts is dissolved during the solubilisation phase a') separate from the phase a), said solutions obtained respectively from the phases b) and a') being mixed together, before the concentration phase c).

30. The fertiliser as claimed in claim 19, characterised in that it is obtained by a method in which, during the solubilisation phase a) a first portion of one or more soluble salts containing fertilising elements selected from the group consisting of Nitrogen, Phosphor and Potassium is dissolved, while a second portion of said soluble salts is dissolved during the solubilisation phase a') separate from the phase a), said solutions obtained respectively from the phases b) and a') being mixed together, before the concentration phase c).

31. Use of the fertiliser as claimed in claim 19 in the localised fertilisation-irrigation, in widespread fertilisation-irrigation, in leaf fertilisation-irrigation, in hydroponic fertilisation-irrigation or by means of a distribution on the soil followed by irrigation.